FACULTY OF MEDICINE AND HEALTH SCIENCES

UZ GENT

OLD, FORGOTTEN AND NOVEL BIOMARKERS FOR THE DIAGNOSIS AND PROGNOSTICATION OF MULTIPLE SCLEROSIS

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4BRAIN

SUMMARY

Multiple sclerosis (MS) is a chronic inflammatory and degenerative disease of the central nervous system affecting over 2.5 million people worldwide. The disease course is heterogeneous and characterised by a wide spectrum of clinical and radiological features, disability outcomes, and responses to therapy. Therefore, there is an urgent need for reliable biomarkers to capture these different aspects of disease heterogeneity. Predicting an individual's disease course remains an elusive but important goal and the search for biomarkers to identify persons with MS with subclinical disease activity is an ongoing field of investigation. In this dissertation, we assessed the diagnostic and/or prognostic value of several biomarkers that are readily available in routine clinical practice but whose diagnostic and/or prognostic significance remains incompletely elucidated. These biomarkers include the routine cerebrospinal fluid (CSF) analysis, intrathecal kappa free light chains (κFLC) synthesis and motor evoked potentials (MEPs). In total, 3 studies are enclosed within this dissertation.

The findings of the first study revealed that the routine CSF analysis not only provides diagnostic information but also offers valuable prognostic insights. Intrathecal κFLC synthesis further shows great potential for being implemented in the diagnostic criteria for MS. However, if this ever occurs, method-specific differences in its quantification will need to be considered, as illustrated in the second study. Conversely, the preliminary results of our third study suggest limited additional value of complex machine-learning-derived MEP features in the prediction of short-term disability progression in MS.

Future studies should focus on exploring the diagnostic and prognostic potential of novel biomarkers coupled with a critical assessment of existing biomarkers. Currently, no single diagnostic or prognostic biomarker exists for MS, but the combination of clinical, demographic, MRI, and liquid serum and CSF measures, might lead to a reliable multi-parametric prediction model enabling personalised care in MS.

CURRICULUM VITAE

Cathérine Dekeyser graduated magna cum laude as a medical doctor at Ghent university in 2018. She then began an advanced master's program in specialised medicine, with a subspecialty in neurology. Initially, she worked as a neurology resident for 2 years before starting her doctoral training in 2020 at Ghent University. During her doctoral studies, Cathérine followed several courses of the doctoral training program, and presented the findings of her studies at several (inter)national conferences. Throughout her academic journey, Cathérine co-authored 8 A1 publications, 5 of which as a first author. Cathérine is an active member of the European Academy of Neurology and the Belgian Society for Neurology.

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